A Strategic Approach for Funding Research: The Agency for Healthcare Research and Quality's Patient Safety Initiative 2000–2004

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Abstract

Medical errors result in considerable morbidity, mortality, and costs to the health care system. Regardless, research efforts to understand and improve patient safety received relatively little attention or funding prior to 2001. While the Agency for Healthcare Research and Quality (AHRQ) has historically funded some research on patient safety, much of that support was driven by a small number of high-quality investigator-initiated research projects. With the increased focus on patient safety stimulated by the release of the Institute of Medicine's (IOM) 1999 report, *To Err Is Human,* and with a substantial budget increase from the U.S. Congress directed toward patient safety, AHRQ embarked on a strategic approach to develop a large, targeted patient safety research initiative.[*] The main focus of this initiative was a series of six research solicitations developed in response to recommendations in the IOM's report and input from a wide variety of stakeholders convened at a national patient safety research summit. This article describes those six patient safety solicitations, illustrates their potential to improve the safe delivery of health care, and reveals a number of remaining research gaps. The paper also describes a select number of related and follow-on activities undertaken by AHRQ to address the critical issue of patient safety, including a new allocation of funding for health care information technology and its potential for improving patient safety.

Introduction

The Agency for Healthcare Research and Quality (AHRQ) is one of six public health agencies within the U.S. Department of Health and Human Services (DHHS). AHRQ is the lead Federal Agency conducting and supporting research designed to reduce medical errors and to improve patient safety, health outcomes, quality and effectiveness of care, and access to health care services. The research conducted and supported by AHRQ provides information that helps policymakers, payers, providers, and patients make better informed health care decisions.

AHRQ is a major source of funding and technical assistance for health services research and research training at leading U.S. universities and other institutions. AHRQ also is a science partner, working with both public and private

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[*] Detailed information on AHRQ's patient safety grant portfolio can be accessed at http://www.ahrq.gov/qual/newgrants/index.html.

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sectors to build the evidence base for what works—and does not work—in health care and to translate that knowledge into policymaking and everyday clinical practice.[1] In January 1999, the U.S. Congress directed AHRQ to conduct and support research and build private-public partnerships to:

1. Identify the causes of preventable health care errors and patient injury in health care delivery.

2. Develop, demonstrate, and evaluate strategies for reducing errors and improving patient safety.

3. Disseminate such effective strategies throughout the health care industry.

Background

In the past, AHRQ and its predecessors (the National Center for Health Services Research and the Agency for Health Care Policy and Research) funded much of the research on quality and patient safety in the United States. AHRQ's historic approach to funding patient safety research was more opportunistic than strategic.[2] That is, prior to 2000, AHRQ's approach was to fund investigator-initiated research rather than developing Agency-directed requests for research. However, after the November 1999 release of the Institute of Medicine's (IOM) report, *To Err Is Human*, there was a heightened awareness and sense of urgency about medical error and patient safety that were accompanied by a call for more aggressive action to address these widespread problems.[3]

The IOM report also recommended the establishment of a center for patient safety within AHRQ. The center's focus was to enhance the current knowledge base on patient safety by developing a research agenda, disseminating grants for research on patient safety, funding centers of excellence, evaluating methods for identifying and preventing errors, and funding dissemination and communication activities to improve patient safety.[4]

Within weeks of the release of the IOM report, AHRQ published a targeted solicitation for research on systems-related best practices in patient safety that had been under development since early 1999. Six patient safety projects resulting from this solicitation were funded in 2000. They included awards to:

1. Virginia Commonwealth University (Steven H. Woolf, Characterizing Medical Error: A Primary Care Study).

2. New England Medical Center (Harry P. Selker, TIPI Systems to Reduce Errors in Emergency Cardiac Care).

3. University of Maryland (Colin F. MacKenzie, Brief Risky High-Benefit Procedures: Best Practice Model).

4. Stanford University, Mark McClellan (Developing Best Practices for Patient Safety).

5. Brigham and Women's Hospital (David W. Bates, Improving Safety by Computerizing Outpatient Prescribing).

6. University of Texas Medical School-Houston (Eric J. Thomas, Teamwork and Error in Neonatal Intensive Care).

In 2001, several changes transpired at AHRQ in response to the increased attention to patient safety. The Center for Quality Improvement and Patient Safety (CQuIPS) was established as recommended by the IOM and approved by the U.S. Congress. This replaced and broadened the mission of AHRQ's previous Center for Quality Measurement and Improvement. The U.S. Congress increased AHRQ's patient safety research budget from $20 million to $50 million for 2001. AHRQ initiated a new, strategic approach by soliciting a series of targeted patient safety research projects to address some of the issues noted in the IOM report as well as in a research agenda developed through a national summit on medical errors and patient safety research held in 2000. This summit was sponsored by several Federal Government entities including AHRQ.[5, 6] At the summit, both written and oral testimony was collected from witnesses to help identify issues that were most in need of research. Analysis of the testimony identified the following series of thematic research questions that were used in developing AHRQ's patient safety research agenda.

- What causes medical errors?

- What role does human factors play in medical errors?

- What technological interventions improve safety?

- What working conditions promote safety and decrease medical errors?

- What roles do different parties (e.g., consumers, providers, purchasers, legislators, oversight bodies) play in improving patient safety and how can those roles be coordinated?

- What effect does training, including the use of simulation, have on safety?

- What cultural, organizational, and leadership factors hinder or promote safety improvements?

- What makes a medical error reporting system successful and how can success be measured?

- What factors facilitate or hinder successful data collection and use in medical error reporting systems?

- How can useful information on patient safety be provided to those who can act upon it?

- How can the dissemination and adoption of proven safety practices be improved?

Based on input from the summit coupled with the IOM recommendations and a significantly expanded patient safety budget in fiscal year 2001, AHRQ funded

more than $50 million in research projects that targeted patient safety. It represented the single largest research investment the U.S. Federal Government had ever made to combat medical error. This was again matched in 2004 when another $50 million was allocated to health care information technology (HIT) projects and their supporting role in improving patient safety. This paper focuses primarily on the six patient safety research solicitations that arose from the 2001 efforts, the potential they have to reduce medical errors and improve patient safety at the clinical level, and major remaining research gaps. The HIT endeavor and several other patient safety-related activities also are described.

Patient safety and the changing clinical environment

As noted in the IOM report, approximately 3 to 4 percent of hospitalized patients suffer preventable injuries, and medical errors in hospitals are responsible for approximately 44,000 to 98,000 deaths per year. There has been and continues to be some controversy over these estimates. However, additional research continues to suggest that the magnitude of the problem is significant. One recent study using patient safety indicators (PSI) suggests that more than 32,000 deaths annually may be attributable to the 18 types of medical injuries reflected in the PSIs.[7] Furthermore, the Centers for Disease Control and Prevention estimates that hospital acquired infections impact about two million people annually and result in 90,000 deaths.[8]

The delivery of health care has become increasingly complex. As it is currently delivered however, health care continues to take place in often isolated micro systems with modest standardization, accompanied by inadequate safeguards especially in comparison to other complex industries such as nuclear energy and aviation. At the same time, health care has seen rapid growth in new technologies and pharmacotherapies along with increasingly rigid cost constraints and less-than-optimal working conditions. Consequently, the development of and reliance on effective systems for the delivery of safe, high quality care becomes more and more critical.

Overview of the six patient safety research solicitations released in 2001

At the core of AHRQ's patient safety initiative is a portfolio of projects to test the effectiveness and costs of diverse reporting strategies—an area of high interest to the U.S. Congress as evidenced by their mandate to allocate almost half of the AHRQ patient safety funding in 2001 towards this activity. In addition to evaluating reporting systems, AHRQ intends to:

- Establish multidisciplinary centers of excellence in patient safety.

- Target efforts to understand the impact of provider education, skills, staffing, and organization on error rates.

- Develop partnerships with health systems networks, professional organizations, states, and other groups to build capacity for error reduction activities, disseminate effective strategies, and coordinate public and private efforts.

- Test information technology innovation for the identification, management, and reduction of medical errors.

Six solicitations for focused research were issued over a 6-month period. The solicitations include:

1. Centers of Excellence (COE) for Patient Safety Research and Practice.

2. Clinical Informatics to Promote Patient Safety (CLIPS).

3. Developing Centers for Patient Safety Research and Practice (DCERPS).

4. Effect of working conditions on patient safety.

5. Health system error reporting, analysis, and safety improvement demonstrations.

6. Patient safety research dissemination and education.

Centers of Excellence

The Centers of Excellence for Patient Safety Research and Practice solicitation focused on providing long-term (i.e., 5-year) support for organizations that were already conducting patient safety research, had already formed multidisciplinary teams, and included members in multiple health care delivery systems. Researchers were required to address three of four major areas in patient safety research. The first area was learning from errors, defined as the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim. Errors could include problems in practice, products, procedures, or systems.[4] The remaining areas included the epidemiology of errors; the impact of systems and culture on errors and patient safety, defined as initiatives designed to prevent adverse outcomes from medical error; and the role of informatics in patient safety. Over the 5-year period, each grantee is required to have three ongoing projects at all times and no more than seven projects total—all related to a patient safety theme identified by the applicant. Only three applicants were funded under this request for applications (RFA), suggesting that the level of experience and expertise to support such centers for patient safety research was somewhat limited at that time. These three grantees are conducting 15 research projects related to improving drug safety among diverse patient populations such as pediatrics, nursing home residents, and psychiatric patients; reducing errors in the medication use process in different settings of care; and translating best safety practices from aviation to health care by investigating team training and

organizational culture, learning from errors, and observing the impact of close-call reporting on the reduction of errors.

Clinical Informatics to Promote Patient Safety

The Clinical Informatics to Promote Patient Safety (CLIPS) solicitation focused on the use of information technology (IT) to prevent medical errors in an increasingly complex health care delivery system. While some evidence has shown that certain IT applications, such as physician order entry and computerized decision support systems, can improve patient safety,[9, 10, 11] only a small proportion of health care facilities in the United States have such systems in place. Although clinical informatics has the potential to markedly reduce medical errors, there is still a great need for research on how to optimally use IT to improve patient safety. Furthermore, there is a need to learn more about the barriers to adoption and implementation of IT in the health care setting and the incentives needed to encourage the use of existing technologies that have proven to be effective. Finally, it is important that IT solutions be field-tested to ensure that the technology improves safety without producing unintended harmful consequences.[12]

Research is needed to achieve the following:

- Evaluate IT tools that alert providers to information that may be critical to the provision of safe care.

- Develop strategies to address barriers to successful adoption of innovative IT applications.

- Document the costs and resources associated with the IT applications.

- Evaluate transferability to multiple settings.

Although AHRQ is interested in studying a wide range of IT applications, the Agency focused its initial efforts on soliciting research involving computerized decision support systems, hand-held electronic medication and specimen management systems, medication bar coding systems, automated medication dispensers, computerized simulators for education and training, and patient-specific identification systems such as computerized bracelets and smart cards. AHRQ is also interested in research projects assessing the opportunities for and barriers to using IT for improving the process and outcomes of care for patients and providers. Because most of the research on IT and patient safety has been done in the inpatient setting, the Agency was particularly interested in projects that evaluate IT solutions across a range of health care settings including ambulatory care facilities, emergency departments, long-term care, and home health care.

Under the CLIPS solicitation, 11 research projects were funded for up to 5 years to help improve the safe delivery of health care. Examples of the types of projects currently underway include four studies that are investigating the impact of using handheld, computerized decision support tools in the ambulatory care setting. Two of these projects reflect studies in adult primary care and the other

two studies involve pediatric primary care clinics and a pediatric emergency department. Another study focuses on the use of computerized simulation tools to train surgeons, identify and analyze actual and potential errors, and monitor the ongoing performance of the surgeons. A different study examines the use of an automated data surveillance system designed to identify and characterize medical errors using electronic medical records.

Developing centers for patient safety research and practice

Given that patient safety is a relatively new field of research and has been an underfunded area of study, one of AHRQ's key goals was to support and expand long-term research capacity by funding developing centers of patient safety research designed to address current and future patient safety needs as they arise. In support of this goal, these multi-phased 3-year developmental grants were designed to enhance the Nation's capacity to carry out patient safety research and translate those research findings into practice. Following planning activities in the first year, each grantee is conducting at least one pilot study in the subsequent year(s) of the grant. Critical to the development of a successful center are multidisciplinary team building to conduct fundamental research on patient safety, ties to existing health care delivery systems such as hospitals and clinics, and evidence-based educational programs on the importance of patient safety. Now that each developing center's planning objectives have been met, each center is conducting at least one pilot study and is proposing the means by which to disseminate the subsequent research findings. The 19 grantees funded in this program initially reflected varying degrees of expertise and experience. Nonetheless, after completing this work, each of the 19 developing centers is anticipated to be qualified as a center of excellence and positioned to compete for future patient safety research funding from AHRQ and other funders of patient safety research.

Effect of working conditions on patient safety

Efforts to reduce costs and streamline the delivery of health care have led to significant changes in the health care workplace such as provider mix, staffing, and work hours. These changes may have an adverse affect on health care workers and the quality and safety of the care they deliver. Previous research in other industries indicates that differences in the equipment and physical characteristics of the workspace, changes in work processes, and differences in staffing can influence the quality of the products or services produced.[13, 14] Yet in health care, current research findings are ambiguous or conflicting.[15–18]

The content of the solicitation to assess the effect of working conditions on patient safety resulted from feedback from key stakeholders and two conferences sponsored by several Federal agencies, including AHRQ. These conferences included the Effect of Working Conditions on Quality of Care (1999), and Enhancing Working Conditions and Patient Safety: Best Practices (2000). The conferences explored current evidence on staffing levels, working hours, physical environment, workflow design, organizational culture, and other key elements of

working conditions. They also assessed the impact of these elements on safety and quality of care. Using input from stakeholders and conferences, AHRQ issued a research solicitation aimed at exploring the relationship between health care working conditions, its effects on health care workers, and its impact on the safety and quality of the care they deliver.

While it may be intuitive that good working conditions lead to improved safety and quality of care, there was little empirical evidence to support this assertion at the time this call for research was framed. The 21 projects funded under this solicitation are, therefore, intended to identify, characterize, and measure the impact of the work environment on the safety and quality of care provided by health care workers. They also are intended to test innovative approaches to improving working conditions that have been effective in other industries. Examples of the studies underway include projects investigating the following issues:

- Impact of nurse working conditions on medication safety.

- Impact of nurse fatigue on patient safety.

- Effect of extended work hours on intensive care unit patient safety.

- Impact of unit-level nurse workload and patient safety.

- Relation of hospital workload to patient safety.

- Impact of working conditions on adverse events in home health care.

- Impact of fatigue and alcohol on advanced life saving skills exercised by emergency medical technicians and paramedics.

Together, these projects will generate important, new knowledge on the impact of physical environment, workflow design, workforce staffing, and organizational culture that can be used to improve patient safety and quality of care.

Health system error reporting, analysis, and safety improvement demonstrations

The IOM's report, *To Err Is Human,* outlined four critical steps in reducing the risk to patients from errors in health care delivery.[3] One of those steps was to develop systems to collect information on errors that have occurred in order to learn from those mistakes and reduce the opportunity for future errors and harm to patients. The literature includes some studies on the use of medical event reporting. For example, the literature on non-medical event reporting systems was reviewed looking for clues to their success. The literature reported that incentives are needed to promote voluntary reporting and that the reporting must be confidential, encourage accountability, and include an emphasis on systems perspectives.[19] In another study, researchers identified what they believed to be the ideal attributes of medical event reporting systems. In general they included a comprehensive system of data collection and reporting without reprisal, the ability

to follow back to the root cause to find underlying system failures, and a multidisciplinary approach to developing, implementing, and tracking the effectiveness of interventions and corrective actions.[20] Despite these studies, the evidence base on successful reporting systems remains vastly underdeveloped, especially in regards to the successful implementation of such systems and their ability to improve patient safety.

In early 2000 the Quality Interagency Coordination Task Force (QuIC)—which is composed of agencies and departments within the United States Federal Government, with AHRQ as the lead agency—developed an action plan to address medical errors and patient safety as a follow-up to the IOM report. In this report, *Doing What Counts for Patient Safety: Federal Actions to Reduce Medical Errors and Their Impact*, the QuIC outlined a plan of action that involved more than 100 activities, including conducting research to identify the most effective means for collecting and using information on errors and using this information to prevent future errors.[4] The QuIC report acknowledged that patients (or their family members) who are harmed have a right to be told when an error that results in harm occurs.

Based on the IOM and QuIC reports, reviews of the literature, and AHRQ's use of the research agenda developed from the national summit, the Agency initiated a $25 million research solicitation, the Health System Error Reporting, Analysis, and Safety Improvement Demonstrations. Its purpose was twofold: to evaluate a variety of established or soon-to-be implemented medical error reporting systems to improve the safety of patients being cared for in a variety of medical settings, and to test effective methods of communicating information on harm to patients and their family members. The research solicitation focused on projects that would demonstrate and evaluate the following:

- Methods of identifying errors or opportunities for improving safety and reporting errors in a database that promotes analysis, understanding, and action to reduce the risk of harm to patients.

- Different types of information necessary and useful for reducing risks to patients.

- Effective methods of disseminating information to improve safety.

- New methods of changing the delivery system in ways that can reduce hazards, including innovations in the use of information technology and educational changes.

AHRQ was particularly interested in projects testing systems that publicly disclosed information on errors or risks and compared those systems to ones that were principally designed to enhance providers' ability to learn to prevent errors. Projects that characterized the feasibility of different methods of electronic data collection and analysis and facilitated the processing and use of large amounts of data also were of interest. To the extent possible, projects were expected to use data capable of examining segments of the population that might be especially at risk for injuries from medical errors. For example, certain groups may be more

vulnerable to certain kinds of errors such as missed or inaccurate diagnoses, use of incorrect selection or application of therapies, failure to properly communicate with other caregivers, and failure to adequately communicate with the patient or family. These population segments include people with chronic conditions requiring frequent interaction with the health care system, people with limited English proficiency, people with disabilities, the elderly, children, or people living in rural areas with limited access to technologies or health professionals.

Sixteen 3-year grants to evaluate a variety of reporting systems were awarded. These 16 projects represent three categories: voluntary reporting systems, mandatory reporting systems, and mandatory reporting systems that included a component for notification of the patient and/or the affected patient's family. While each of the funded grants was classified into one of the three general categories, the projects also represent other categories such as:

- State reporting systems (e.g., Massachusetts, New York, Georgia, Utah).

- An intensive care error reporting system developed in partnership with professional associations.

- Malpractice insurance programs as a potential nationwide error reporting system.

- A reporting system that includes different methods of reporting (e.g., telephone hotlines, Web-based, paper).

- Projects aimed at understanding how health care workers communicate information about medical errors to patients and their families.

Preliminary observations from this research provide a number of insights. These observations suggest that:

> *"1) no single data source is sufficient to gain a complete understanding of medical errors contributing to actual or potential patient injury…. 2) the ability to identify patient safety problems would be enhanced by the availability of data guidelines and standards…. 3) despite patient safety standards from JCAHO that require hospitals to disclose to patients all unexpected outcomes of care, there appears to be great variability in the degree and process of error disclosure. 4) legal protection of reported data is critical if medical error reporting is to be truly effective in improving patient safety…."[21]*

Because the observations are preliminary, they may be subject to change once these research projects are completed in 2004–2005.

Patient safety research dissemination and education

As noted in the IOM report, educational leadership organizations, professional associations, and provider organizations can play a prominent role in helping to build a positive safety culture that begins with professional education and

orientation of new professionals.[3] Each of these groups can contribute to the creation of a culture that encourages the identification and prevention of errors. However, few professional societies or groups demonstrated a visible commitment to improving patient safety, and there was little collective action through the early part of 2001.

The report from the Council on Graduate Medical Education and the National Advisory Council on Nursing Education and Practice notes that practice approaches have their foundation in the education and training system of health care providers.[22] The research projects funded through this solicitation were intended to support professional associations, educational leadership organizations, and provider organizations in developing, demonstrating, and evaluating new approaches to improving provider education and practice in order to reduce medical errors and to create a culture of improved patient safety. The projects are expected to capitalize on advances in knowledge about medical errors and to be replicable on a larger scale. They are designed to translate established strategies to reduce medical errors into widespread use through provider education. The highest-priority programs were those that make maximum use of active learning through the use of simulation, team training, and Web-based instruction as well as traditional educational approaches that disseminate, implement, and evaluate provider education.

Six studies, conducted for up to 3 years, were funded to address innovative approaches to provider education. These projects focus on how provider education can reduce medical errors or how creating a culture that emphasizes patient safety could lead to improved patient safety outcomes. For example, one project compares simulation-based training to current patient-based methods of training in cardiac catheterization. Another study focuses on comparing high-fidelity simulation to more traditional models for training around neonatal resuscitation. A third study focuses on developing a standard Web-based method of patient safety education and training for physicians. Projects are expected to be applicable to situations and settings beyond that of the specific funded project.

Research themes

The projects developed in response to this new, expansive patient safety initiative make great strides in filling research gaps. For example, five grants address the epidemiology of error as a principal goal. Four concentrate on the infrastructure to improve patient safety, and 11 projects study information systems as their principal goal. Twenty-seven of the projects assess interventions while 18 of the projects investigate mechanisms of patient safety research such as developing research capacity, maintaining multidisciplinary approaches, engaging the legal community, and forming partnerships among funders, researchers, etc. However, gaps in the research remain, with the heaviest emphasis on:

- Adoption issues such as barriers to adoption of interventions, facilitators to interventions, and the costs of interventions to reduce medical errors and improve patient safety.

- Use of information by those who can act to adopt effective interventions and show consumers how to identify risk.

- Transition issues such as communication among health care workers and collecting and using data as patients move through different levels of care and institutions.

- Ongoing issues related to the impact of organizational and professional culture, maintenance of a patient-centered focus in patient safety research, means to foster coordination efforts, and the role of qualitative and quantitative measures in patient safety research.

These gaps could become the focus of additional research efforts.[23]

Managing and evaluating AHRQ's patient safety research initiative

Given the number and breadth of projects included in the patient safety initiative, it was clear from the beginning that this program required more comprehensive management support and evaluation methods.

Management support

In addition to using a coordinated approach in developing and funding the many projects in the patient safety research initiative, a coordinated method of managing these projects also was initiated. This included the development of a cross-Agency team of AHRQ project officers responsible for the programmatic administration and oversight of these patient safety grants. The project officers met regularly to discuss cross-cutting issues and progress of projects funded within each solicitation. The large increase in the number of grants funded through the patient safety research initiative was not accompanied by an associated increase in the number of AHRQ staff available to manage these research projects. To provide support in this coordinated and expanded management function, AHRQ established a patient safety research coordinating center (PSRCC). The PSRCC is responsible for providing logistical support to AHRQ in organizing annual conferences of patient safety grantees and stakeholders, developing and supporting an intranet site to facilitate information sharing among the grantees and selected stakeholders, providing technical assistance to grantees on a variety of topics, and analyzing data and reporting periodically on the progress of grantees. These support functions enable AHRQ to more comprehensively manage the patient safety initiative in its entirety.

Evaluating the initiative

The evaluation of AHRQ's patient safety initiative is designed to examine the return on investment of the research outlined here. In September 2002, AHRQ awarded a contract for a comprehensive evaluation focusing on context, input, process, and product evaluation. This contract evaluates the impact of the entire

patient safety research initiative including projects funded in the initial efforts and those following in 2003 and 2004. In addition to supporting evaluation activities, this contract also included the conduct of a one-day patient safety research summit in 2003 for the purposes of reviewing the progress to-date on the Agency's research agenda and the development of future directions.

New directions

AHRQ's historical research focus has been on creating new knowledge and disseminating it. However the Agency is progressing towards a modified mission that also includes a substantial emphasis on implementation. With its new mission evolving, AHRQ has devoted and continues to devote additional effort towards implementation of research findings in order to create more substantive changes in today's health care system.

2003 safe practices implementation challenge grants

In 2003, AHRQ released a call for research focused on risk assessment and implementation of safe practices. Six risk-assessment grants were awarded addressing issues such as:

- Reducing errors that lead to re-hospitalization.

- Assessing risks associated with chemotherapy.

- Identifying issues associated with transplant/donor recipient mismatches.

- Assessing the risks leading to medication errors in various health care settings.

- Using labor and delivery as a model for risk and recovery in complex health care delivery environments.

Seven implementation projects were funded that address the following issues:

- Reduction of medication errors using intravenous smart pumps and medication administration using bar codes.

- Use of bedside technology to improve medication safety in nursing homes and residential care/assisted living facilities.

- Reconciliation of electronic medication lists and care plans for improved outpatient medication management.

- Refinement of an experimental pharmacy alert system.

- Reducing the risk of adverse events associated with blood transfusions.

- Using evidence-based practices to reduce hospital-acquired infections.

- Implementation of interventions in intensive care units (ICU) that reduce catheter-related blood stream infections and ICU mortality.

2004 health care information technology and patient safety projects

In 2004, AHRQ's budget included $50 million committed explicitly to HIT and its capacity to improve patient safety. The development of these projects is still underway, and focused research has been requested in three areas in support of this effort. One area is in assessing the value resulting from the adoption, diffusion, and use of HIT and its ability to positively impact patient safety and quality. The knowledge assembled from these projects is anticipated to provide stakeholders with information needed to better understand and use HIT to reduce medical errors; increase use of effective interventions; decrease use of those that are less effective; enhance coordination of care; and increase efficiency, productivity, and accountability.[24]

In addition to assessing the value of HIT in patient safety, there are two current calls for research focused on planning and implementation. Both of these efforts emphasize partnerships that embrace multiple health care organizations within local or regional areas. The partnerships include acute care hospitals, clinics, and health care providers in diverse settings (e.g., ambulatory care, long-term care, home health). The goals of these two calls for research are to support planning and implementation efforts that result in standards-based data sharing across multiple care sites and that lead to measurable and sustainable improvements in patient safety and quality of care. Furthermore, rural and small communities are a special emphasis included in the planning and implementation grants.[25, 26]

Conclusions

Prior to the release in 1999 of the IOM report, *To Err Is Human,* AHRQ was in the process of developing a single patient safety research solicitation. However, the release of that report catapulted patient safety to the forefront of attention. As a result, AHRQ's fiscal year 2001 appropriation included $50 million for an initiative to reduce medical errors and improve patient safety. AHRQ responded to this mandate by developing a series of six research solicitations that form an integrated set of activities to develop the science base to inform these efforts, improve provider education to reduce errors, capitalize on IT advances to translate proven effective strategies into widespread practice, and build research and implementation capacity to further reduce medical errors. Research themes were generated through a variety of mechanisms, including key stakeholder meetings, national public and private sector summits, IOM recommendations, and reviews of the literature. The result of these efforts was the development of a user-driven research agenda, wherein those who would eventually use the products of patient safety research—including providers, plans, purchasers, patients, and policymakers—identified areas where AHRQ should focus its research efforts. While some preliminary findings have been released, within the next year we will begin to see the full complement of results from research first funded in early 2000 and throughout the next 3 years.

It is imperative to understand that generating new knowledge, by itself, is not enough. Findings from AHRQ's patient safety research portfolio must be analyzed, widely disseminated, and implemented into clinical practice so that patient injuries caused by the delivery of health care become rare events and so the U.S. health care system becomes as safe as possible. To further promote patient safety efforts, AHRQ has expanded its mission to include implementation of evidence-based findings, and has been able to devote more research funds to planning and implementation projects with the potential to improve patient safety and to reduce the opportunity for and impact of medical errors. The vast majority of these projects, which will be funded in 2004, will rely on HIT to promote improved patient safety and quality.

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